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THE ORIGIN, CHARACTERISTICS, AND QUALITY OF HUMPBACK WHEAT.[1]

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INTRODUCTION.

The term Humpback is applied to a strain of wheat which is being grown to an increasing extent in Minnesota and to a limited extent in the Dakotas. This wheat has found favor with the producers because of the large yields claimed for it, but it is generally discriminated against by the grain trade because of its alleged inferior milling qualities.

This strain of wheat is said to be the result of a field selection by J. P. Berglund, a farmer living near Kensington, Minn., who about 18 years ago found, growing in a field of Bluestem wheat, a plant distinguished from the rest of the field by bearded heads and a more vigorous growth. The seed from this plant was saved and planted separately, producing a strain of wheat known as Humpback, which wheat was first distributed among the Kensington farmers 11 or 12 years ago. It was originally called Bearded Bluestem, a name given to it by Mr. Berglund because it has the characteristic velvety chaff of Bluestem, but it soon earned the more popular name of Humpback, owing to the peculiar shape of the kernels, the dorsal side being characterized by a prominence immediately to the rear of the germ and a curved slope toward the brush, making the term Humpback quite descriptive.[2] The term Marvel, and perhaps other names, has been applied to this variety by distributors of the seed.

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[1] The investigations reported herein were made by the Office of Grain Standardization of the Bureau of Plant Industry. Since August 18, 1916, the grain-standardization work of the Department of Agriculture has been administered jointly by the Office of Markets and Rural Organization and the Bureau of Plant Industry in connection with the administration of the United States Grain Standards Act.

The data contained in this bulletin represent the results of investigations made by Mr. Levi M. Thomas, in charge of the Grain-Standardization Laboratory at Fargo, where special investigations are being carried on in cooperation with the North Dakota Agricultural Experiment Station relative to the milling and baking value of different classes and grades of wheat.

[2] Certain eastern soft-wheat varieties have this same characteristic to fully as marked a deegree as the Humpback. The variety known as Rural New Yorker No. 57 is especially similar to the Humpback in all general characters.

Note.—This bulletin will be of interest to millers and grain dealers in the States of North Dakota, South Dakota, Minnesota, and Montana, and to the grain exchanges and inspection departments in the various markets.

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Care should be taken not to confuse Humpback wheat with the more widely grown varieties of the Northwest, commonly, though incorrectly, known as Velvet Chaff. The Velvet Chaff wheats, sometimes classified as the Preston group, are bearded but are of the Red Fife type, and the kernels are much smaller than those of the Humpback, approaching closer to the Fife and Bluestem wheats in size and quality. Another point of difference is apparent in the heads of the wheat. Humpback wheat has, as already stated, a velvety chaff, while curiously enough the bearded spring wheats, commonly known as Velvet Chaff, are characterized not by a velvety but by a smooth chaff. The comparative shape and size of Humpback, Velvet Chaff, Glyndon Fife (Minnesota No. 163), and Bluestem wheats are shown, natural size, in Plate I.

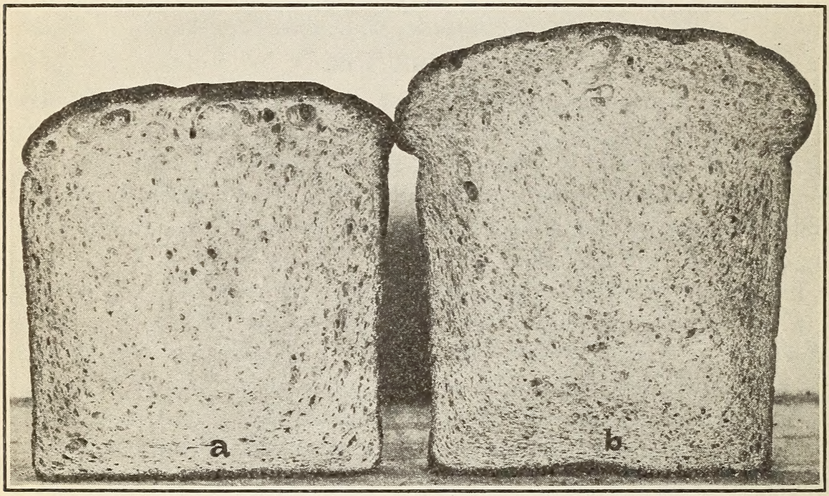

FIG. 1.—Bread made from samples of Humpback and Bluestem wheats grown near Glenwood, Minn., in 1913: *a*, Loaf from Humpback wheat, yielding 73 per cent of straight flour and having a loaf volume of 1,970 cubic centimeters and a texture score of 87.5; *b*, loaf from Bluestem wheat, yielding 74 per cent of straight flour and having a loaf volume of 2,445 cubic centimeters and a texture score of 93.5.

Humpback wheat has a large berry as compared with most strains of the hard spring wheats, in point of size being midway between the common varieties of spring wheat and the durums. The kernels are of a dark amber color and are perhaps a little softer than most wheats of this class. The weight per bushel will be found to range somewhat higher than the Fife and Bluestem wheats, the average of nine samples from the 1910 crop being over 60 pounds per bushel.

MILLING AND BAKING QUALITIES.[1]

Table I gives the comparative results of the milling and baking qualities of a limited number of samples of Humpback and other

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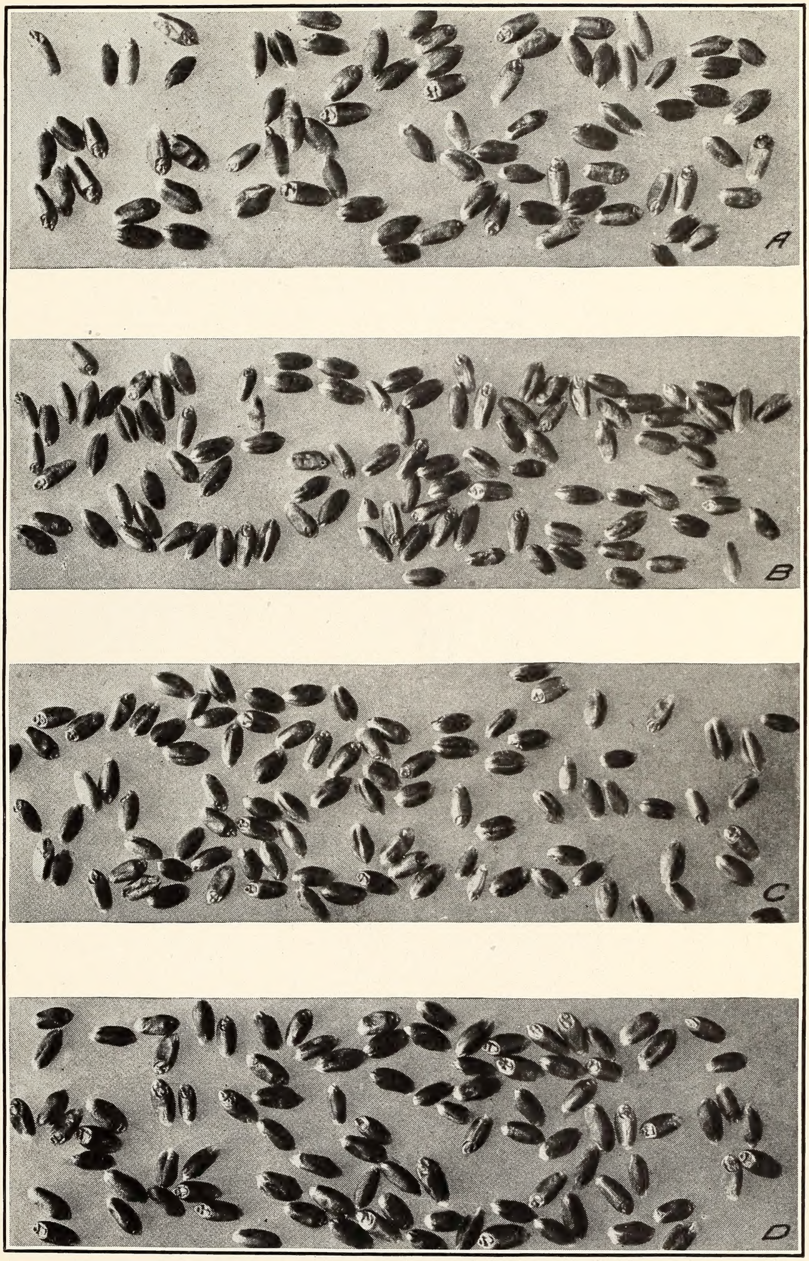
[1] The Minnesota State grain-inspection department under the grade rules for northern spring wheat specifies that "the variety known as 'Humpback,' owing to its inferior milling quality, shall not be graded higher than No. 3."



TYPE SAMPLES OF SOME OF THE SPRING WHEATS: *A*, HUMPBACK; *B*, VELVET CHAFF; *C*, GLYNDON FIFE (MINNESOTA NO. 163); *D*, BLUESTEM. (NATURAL SIZE.)

hard spring wheats. Attention is called to the fact that the results on the Humpback wheat, as shown in the table, include tests of samples representing the crops of the three years, 1908, 1909, and 1910. The crops of 1908 and 1909 are represented by one sample each, and the crop of 1910 by nine samples. Five of the samples of the 1910 crop were secured near Hoffman, Minn., and the remaining four from near Kensington, Minn. At each of these points a sample of Bluestem wheat was also obtained, the results of milling and baking tests upon the same being likewise shown in Table I. The figures at the bottom of the table give the average of tests of Bluestem and Velvet Chaff wheats from North Dakota and Minnesota of the 1910 crop and afford an interesting comparison with the Humpback wheat, to the disadvantage of the latter. With the exception of samples 255 and 502, the results as given in the table are based on the yield of "straight flour," the tests on these two samples being on the patent flour.

TABLE I.—*Comparison of results of milling and baking tests of Humpback wheats with other hard red spring wheats.*

Description and source of sample.	No.	Yield of straight flour.	Volume of loaf—		Absorption (water used per 100 grams of flour).	Color of crumb.	Crude protein (N × 5.7).	
			Per 340 grams of flour.	Per 100 grams of flour.			In flour.	In wheat.
Humpback wheat from—		*Per ct.*	*C. c.*	*C. c.*	*C. c.*	*Score.*	*Per ct.*	*Per ct.*
Kensington, Minn., crop of 1908	[1] 255	[1] 70.82	2,138	629	51.8	96	12.31	12.31
Kensington, Minn., crop of 1909	[1] 502	[1] 69.7	2,260	681	51.5	91	11.91	12.71
Hoffman, Minn., crop of 1910	637	65.6	2,230	656	51.8	91	12.77	14.19
Do	700	68.7	2,400	706	50.6	97	14.65	14.88
Do	701	72.6	2,100	618	50.0	96	13.97	14.82
Do	702	72.5	2,010	591	50.0	95	14.99	15.79
Do	703	69.7	2,150	632	50.0	95	14.54	15.16
Kensington, Minn., crop of 1910	704	72.8	2,150	632	50.0	96	12.60	12.77
Do	705	72.4	2,120	624	49.7	96	13.34	14.02
Do	706	72.8	2,090	615	48.2	95	13.05	13.22
Do	708	73.4	2,050	603	48.2	95	13.91	14.36
Bluestem wheat from—								
Hoffman, Minn., crop of 1910	699	69.5	2,590	762	52.4	98	14.36	14.82
Kensington, Minn., crop of 1910	707	73.2	2,260	665	50.3	97	14.02	13.91
AVERAGES.								
Humpback wheats from—								
Hoffman, Minn., crop of 1910		69.8	2,176	640	50.5	94.8	14.19	14.95
Kensington, Minn., crop of 1910		72.9	2,105	619	49.0	95.5	13.23	13.59
Both Hoffman and Kensington, crop of 1910		71.2	2,145	631	49.8	95.1	13.76	14.35
Eight samples of Bluestem wheat from North Dakota and Minnesota, crop of 1910		69.2	2,430	715	52.1	97.1	12.59	13.4
Seventeen samples of Velvet Chaff wheat, grown in North Dakota, 1910		66.9	2,428	713	52.4	99	13.37	14.52

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[1] With samples 255 and 502 the tests were made on the patent flour, but in all other cases on the straight flour.

From the standpoint of flour yield, as obtained upon the experimental mill of the North Dakota Agricultural Experiment Station, it will be noticed that the Humpback wheat, like other large-berried varieties, gives a high yield of flour, in this respect probably excelling the smaller berried varieties. However, in the study of the next three columns in the table we do not find that the figures speak so well for the Humpback wheat. The volume of the loaf, which is the approximate expression of the "baking strength" of the flour, in all cases falls well below the average for the spring wheats. A comparison of the results of the absorption, or the amount of water used in making the dough, does not show such striking differences, but most of the samples fall below the average in this respect. In color of crumb, which is a factor of considerable importance to the baking trade, it will be noticed that the bread made from the Humpback wheat flour is not up to the standard. Figure 1 shows the actual differences in loaves produced from samples of Humpback and Bluestem wheat grown near Glenwood, Minn., in 1913.

The figures in the last two columns of the table, showing crude protein in the wheat and the flour, are interesting. It will be noted that here we have a point of resemblance between the Humpback and the durum wheat, as the Humpback wheat averages high in crude protein and yet is low in "baking strength."

CONCLUSIONS.

In conclusion, the principal points may be briefly stated as follows:

Humpback wheat is a bearded spring wheat characterized by a velvety chaff.

This wheat should not be confused with the so-called Velvet Chaff wheats of the Northwest, which are bearded spring wheats of the Red Fife type and have a smooth chaff.

Humpback wheat has a large berry, somewhat soft in texture, giving a high yield of flour. The weight per bushel of this wheat is higher than that of Bluestem wheat.

The flour from the samples of Humpback wheat was lower in baking strength and general quality than the flour from the other spring wheats which were tested.

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